

CLAIMS

What is claimed is:

1. A heater and air-conditioning assembly for a vehicle
5 comprising;
a compressor for compressing a refrigerant,
a front end condenser for condensing fluid from said compressor,
a chiller-condenser disposed downstream of said condenser,
a chiller-evaporator disposed downstream of said chiller-condenser,
10 a main three-way valve disposed between said compressor and said
condenser for directing flow from said compressor to said condenser in an air-
conditioning mode and for directing flow from said compressor through a by-pass line
to said chiller-condenser in a heat pump mode,
a heat pump expansion device for exchanging heat with the refrigerant
15 in said heat pump mode, and
a by-pass valve disposed between said chiller-condenser and said
chiller-evaporator for directing flow from said chiller-condenser through said heat
pump expansion device and to said chiller-evaporator in said heat pump mode.

2. An assembly as set forth in claim 1 including an air-conditioning expansion device disposed downstream of said condenser and upstream of said bypass line for expanding the refrigerant in the air-conditioning mode.

5 3. An assembly as set forth in claim 2 including a return line from said chiller-evaporator to said compressor.

4. An assembly as set forth in claim 3 including an accumulator-dehydrator in said return line.

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5. An assembly as set forth in claim 2 including a cabin heat exchanger, a coolant feed line for conducting coolant flow from said chiller-condenser to said cabin heat exchanger, a coolant exit line for conducting coolant from said cabin heat exchanger to said chiller-evaporator, and an interconnect line for conducting coolant
15 from said chiller-evaporator to said chiller-condenser.

6. An assembly as set forth in claim 5 including a circuit pump in said feed line for pumping coolant from said chiller-condenser to said cabin heat exchanger.

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7. An assembly as set forth in claim 5 including a coolant three-way valve in said exit line for directing coolant from said cabin heat exchanger to an engine coolant circuit in said heat pump mode.

8 An assembly as set forth in claim 5 including a coolant three-way valve in said exit line for directing coolant from said cabin heat exchanger to said chiller-evaporator and chiller-condenser in said air conditioning mode.

5 9. An assembly as set forth in claim 8 including a heater in said coolant circuit, an engine pump in said coolant circuit for pumping coolant through an engine and said heater.

10 10. An assembly as set forth in claim 9 including a radiator, a thermostat in said coolant circuit for selectively directing coolant in said coolant circuit through said heater and said radiator and said chiller-evaporator.

15 11. An assembly as set forth in claim 10 including an air-conditioning expansion device disposed downstream of said condenser and upstream of said bypass line for expanding the refrigerant in the air-conditioning mode, a return line from said chiller-evaporator to said compressor, an accumulator-dehydrator in said return line, and a circuit pump in said feed line for pumping coolant from said chiller-condenser to said cabin heat exchanger.